

ABSTRACT OF THE DISCLOSURE

In order to realize accurate measurement with an X-ray fluorescence thickness tester characterized by being non-destructive and non-contacting, a system comprises an X-ray generating source, means for focusing primary X-rays, and a sample observation optical system for positioning and observation of microscopic sections. As thickness measuring means, as detectors for detecting X-ray fluorescence generated from the sample there is one sensor having a low rate but excellent energy resolution used for counting low energy X-rays, and another sensor having poor energy resolution but an excellent count rate used for counting high energy X-rays. These two sensors are arranged next to each other, and in stages subsequent to the detector preamps there are separate linear amps and frequency analyzers with respective signals being subjected to spectral processing for qualitative and quantitative analysis in a common control and computing section.